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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,935	10/10/2001	Jeffrey A. Levin	010364	1124
23696	7590	04/21/2005	EXAMINER	
Qualcomm Incorporated Patents Department 5775 Morehouse Drive San Diego, CA 92121-1714			KIM, KEVIN	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/974,935

Applicant(s)

LEVIN ET AL

Examiner

Kevin Y Kim

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10-10-2001 and 8-13-2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 15, 16, 18-30, 33-36, 38-40, 42-44, 46-50 is/are rejected.
- 7) ☒ Claim(s) 11-14, 17, 31, 32, 37, 41 and 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/25/02</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3-10,36,40 and 44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3,36, 40 and 44 each further define the estimation step of the pilot interference. However, the second step of “multiplying processed pilot data ..... with the estimated channel response...” is considered indefinite because there is no step that produces “processed pilot data.” In other words, “processed pilot data” implies a previous step of processing pilot data but there is no such steps in the base claims 1 and 2. Claims 4-10 are rejected as depending on a rejected base claim.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 1,2,15,16,18-30,33-35,38,39,42,43,46-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang et al (US 6,067,292, submitted as part of IDS by applicant).

**Claim 1.**

Huang et al discloses a method of canceling pilot interference at a receiver unit in a wireless system (see Fig.6), comprising,

receiving a signal comprised of a plurality of signal instances (601,602), wherein each signal instance includes a pilot;

deriving total pilot interference due to one or more signal instances (see col. 7, line 65 to col.8, line 9);

subtracting the total pilot interference from the received signal to derive a pilot-canceled signal (see col.8, lines 9-18); and

processing the pilot-canceled signal to derive demodulated data for each of at least one signal instance in the received signal (see col.8, lines 18-21).

**Claim 2.**

Huang et al estimating pilot interference due to each of the one or more signal instances; and accumulating the estimated pilot interference for the one or more signal instances. (see col.15, lines 16-23);

**Claim 15.**

Huang et al teaches that the subtraction of interference from a received signal is performed using interference samples and data samples, see col. 7, lines 46-48 describing

that “the pilot interference cancellation (subtractions) is performed on the chip samples.

For proper subtraction, the data and interference samples must be provided “at a particular sample rate.”

**Claim 16.**

Huang et al teaches that “the pilot interference” of a signal instance being processed in not included for providing the total pilot interference. See col. 15, lines 16-23 describing that pilot signals of paths 1 and 2 are subtracted from path 1 for an example.

**Claim 18.**

Huang et al teaches oversampling of chip, see col.6, lines 41-43, thus, the sample rate is a multiple of a chip rate.

**Claims 19 and 20.**

In order to derive pilot interference it is required that the total pilot interference be “performed based on segments of data samples” for the received signal and the segments would include at least “data samples of one symbol period” for proper extraction of the pilot interference.

**Claim 21.**

Huang et al teaches the processing to derive demodulated data is performed on segments of pilot-cancelled data samples. See col.8, lines 19-21.

**Claim 22.**

Fig.6 illustrates that the driving of the total pilot interference (606,607) and the processing of the pilot-cancelled signal (605) are performed in parallel.

**Claim 23.**

Fig.6 illustrates that the driving of the total pilot interference (606,607) and the processing of the pilot-cancelled signal (605) are performed in a pipelined manner.

**Claims 24-27.**

Huang et al teaches the receiver is a IS-95 CDMA receiver, see col.3, lines 33-34, thus the communication system in which the receiver is used supports all the variations of CDMA systems such as "CDMA 2000," and "W-CDMA."

**Claim 28.**

Huang et al teaches the received signal can be on "a reverse link." See col. 17, lines 33-35.

**Claim 29.**

Huang et al teaches the received signal can be on "a forward link" in a CDMA system. See col. 17, lines 27-34.

**Claim 30.**

Huang et al discloses a method of canceling pilot interference at a receiver unit in a wireless system (see Fig.6), comprising,

processing a received signal comprised of a plurality of signal instances to provide data samples, wherein each signal instance includes a pilot (see OTS 611 and 612 that processes a received signal to provide data samples);  
processing the data samples to derive an estimate of pilot due to one or more signal instances (see col. 7, line 65 to col.8, line 9);

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deriving total pilot interference due to the one or more signal instances (see col.15, lines 16-23);

subtracting the total pilot interference from the received signal to derive a pilot-canceled signal (see col.15, lines 16-23); and

processing the pilot-canceled signal to derive demodulated data for each of at least one signal instance in the received signal (see col.8, lines 18-21).

**Claim 33.**

Huang et al teaches that the subtraction of interference from a received signal is performed using interference samples and data samples, see col. 7, lines 46-48 describing that “the pilot interference cancellation (subtractions) is performed on the chip samples. For proper subtraction, the data and interference samples must be provided “at a particular sample rate.” Further, Huang et al teaches oversampling of chip, see col.6, lines 41-43, thus, the sample rate is a multiple of a chip rate.

**Claims 34, 38 and 40.**

Huang et al discloses a receiver unit in a wireless communication system (CDMA specifically), comprising;

a receiver for processing a received signal comprised of a plurality of signal instances to provide data samples, wherein each signal instance includes a pilot, see col.6, lines 41-43, describing the reception of a signal and generating samples from the received samples, a demodulator comprising;

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a pilot interference estimator (606,607) to process the samples and derive an estimate of total pilot interference due to one or more of signal instances (see col.15, lines 16-23), a summer (608,609) for subtracting the total interference from the data samples, and a data demodulation unit (605) for processing the pilot-cancelled data samples to derive demodulated data. See Fig.7 additionally. Particularly with respect to claim 42 drawn to a base station in a CDMA, see col. 17, lines 33-35 teaches the received signal can be on “a reverse link,” indicating the receiver can be a base station receiver.

**Claims 35, 39 and 43.**

Huang et al discloses a channel estimator, see co.6, lines 48-54 and col.7, lines 37-39.

**Claims 46, 47 and 48.**

Huang et al teaches that the total pilot interference is obtained by summing the pilots of one or more signal instances. See col.15, lines 16-23.

**Claim 49.**

Huang et al teaches that the total pilot interference is obtained by summing the pilots of one or more signal instances (see col.15, lines 16-23), using “an interference accumulator” (see Fig. 23, adders 2305).

**Claim 50.**



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Huang et al teaches that "the interference accumulator" comprises "a plurality of sections defined by a time offset." (see 2305, 2306 and 2307 comprising "a plurality of sections" having a different time offset).

*Allowable Subject Matter*

5. Claims 11-14,17,31,32, 37,41 and 45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**KEVIN KIM**  
**PATENT EXAMINER**